

# The Canadian Entomologist.

VOL. XXX.

LONDON, AUGUST, 1898.

No. 8.

## A NEW ALPINE GRASSHOPPER FROM WESTERN CANADA.

BY E. M. WALKER, TORONTO.

Among a large number of Orthoptera taken by myself during a trip to the Pacific Coast by the Canadian Pacific Railway there is one species belonging to the Melanopli which I was unable to determine from Scudder's "Revision" of the group, and could not even satisfy myself as to its generic place. I therefore sent a pair to Mr. Scudder, who informed me that it was a new species of *Asemoplus*, but that a change would be necessary in the description of that genus as given in his "Revision of the Melanopli" in order to receive my species. I had noticed the resemblance to *Asemoplus* in the extremity of the male abdomen, but the total absence of tegmina and other points of dissimilarity caused my uncertainty regarding its true generic position.

I have accordingly prepared the following description taken from 3 ♂'s and 5 ♀'s, of which 2 ♂'s and 1 ♀ were taken near Sandon, B. C., in the Gold Range, and the others on Mt. Piron, near Laggan, Alberta. *Asemoplus nudus*, n. sp.

Rather stout and strongly built; tegmina and wings entirely absent; dull olivaceous above in the ♀, black with two longitudinal dorsal yellow stripes in the ♂.

Frontal costa not prominent, fading before the clypeus, equal, sulcate at and below the ocellus, or sometimes throughout in the male, a little wider than the first antennal joint in the ♂, about half as wide again in the ♀. Vertex a little tumid, scarcely raised above the pronotum; fastigium rather steeply declivent, very slightly arcuate, about on a level with the eyes or sometimes a little below in the ♂, feebly depressed, considerably expanded anteriorly.

Interspace between the eyes half as broad again in the ♂, twice as broad in the ♀ as the first antennal joint. Eyes rather small, a little prominent in the ♂, but little longer than broad, subtruncate anteriorly, about as long as the infra-ocular portion of the genæ. Antennæ shorter than the hind femora, in the ♀ about as long as the head and pronotum,

in the ♂ nearly half as long again. Pronotum rather short, the sides nearly parallel in the ♂, but considerably divergent in the ♀, so that the posterior border is more than one-third as long again as the anterior. Disk broadly convex, passing into the nearly vertical lateral lobes without a trace of lateral carinæ. Prozona a little more than twice as long as the metazona, quadrate or slightly transverse in the ♀. Anterior and posterior margins of the disk truncate, the latter slightly emarginate. Median carina slight, nearly obliterated on the prozona, but distinct on the metazona. Posterior margins of lateral lobes but little oblique, forming a decided angle with the lower margin. Prosternal spine nearly vertical, short, conical, not very blunt. Interspace between the mesosternal lobes in the ♂ nearly half as broad again as long and nearly or quite as broad as the lobes themselves, in the ♀ twice as broad as long and distinctly broader than the lobes. Metasternal lobes rather distant in the ♂, more distant than the width of the frontal costa in the ♀. Legs rather stout; fore and middle femora tumid in the ♂. Abdomen with a distinct median carina. Extremity in the ♂ feebly clavate and a little upturned. Supra-anal plate three-fourths as broad at the base as long, triangular with an obtusangulate apex; sides gently emarginate, considerably elevated, median sulcus nearly percurrent, moderately deep, its bounding walls about as much elevated as the sides. Furcula consisting of a pair of minute rounded tubercles. In one specimen, which is the one figured, it is quite distinct and much better developed than in the others, in which it is almost obsolete. Cerci distinctly shorter than the supra-anal plate, about twice as long as the width at the base, compressed, styliform, tapering a little more rapidly in the basal than in the apical half. Subgenital plate rather large, conical, apical margins not elevated above the lateral margins, the latter parallel on their basal half, but narrowing beyond to the small mesially notched apex. Upper valves of ovipositor rather short, not narrowed at base, slightly falciform apically. In the specimen shown on the plate they are more than normally exerted.

*Colour of Dried Specimens.*—Female: Dull, rather dark olivaceous above, dull yellow tinged with olivaceous beneath. Face and lower half of the lateral lobes of the pronotum yellowish-green or olivaceous, more or less clouded with grayish olivaceous, especially on the clypeus and labrum; a broad piceous band starts from the middle of the posterior border of the eye, passes over the upper half of the pateral

lobes of the pronotum, then broadens until it reaches the abdomen, thence gradually narrowing until it disappears at about the last segment. Behind the pronotum it changes from shining piceous to rather dull black. Antennæ olivaceo-fuscous, paler at the base. Fore and middle legs olivaceo-fuscous, yellowish beneath. Hind femora reddish-brown internally, dull orange beneath, dull fuscous externally, with little or no indication of fasciæ above. Hind tibiæ luteous, more or less clouded with olivaceous, and all the colours are darker and duller than in the other specimens.

The male differs in coloration as follows: It is black above, with the exception of a moderately broad, bright yellow stripe running from the upper posterior corner of each eye, along the dorsum of the pronotum just above the lateral lobes and along the abdomen to the last dorsal segment. On the abdomen they are separated by a space of about the width of one of the bands, and are narrowly interrupted at the base of each segment. The black lateral band is much better defined than in the ♀, and on the abdomen is sharply separated from the bright yellow venter. The markings are in general more distinct and the colours brighter than in the female.

Length of body: ♂, 16 mm.-18.5 mm.; ♀, 22.5 mm.-23.5 mm.

Length of antennæ: ♂, 7 mm.-8 mm.; ♀, 5 mm.-8 mm.

Length of head and pronotum: ♂, 5 mm.-5.8 mm.; ♀, 6 mm.-7.5 mm.

Length of hind femora: ♂, 8.5 mm.-10 mm.; ♀, 10.5 mm.-11.3 mm.

The three specimens from Sandon were taken on the grassy path of a snowslide, at an elevation of about 2,600 feet, on September 16, 1897; while those from Mt. Piron were captured on September 19, 1897, at about 7,000 feet, being above timber-line.

In the accompanying plate (A) is a lateral view of the ♀, (B) a dorsal view of the ♂, (C) and (D) are respectively lateral and dorsal views of the male abdominal appendages.

#### A NEW CYCHRINID.

BY THE REV. J. H. KEEN, MASSETT, QUEEN CHARLOTTE ISLANDS, B. C.

This fine plum-coloured beetle—superficially resembling *Cychnus marginatus*—was taken by me in 1896, and kindly named for me by Captain Casey, whose description of it, published in his Coleopterological Notices, No. VII, page 334, I take the liberty of transcribing

below for the benefit of Canadian students who may not see Captain Casey's books. The beetle occurs sparingly, under loose bark or under logs on the ground, along the mainland of British Columbia from Fort Simpson to Rivers Inlet, and probably farther, if sought for. I have never met with a specimen on the Queen Charlotte Islands.

The following is Capt. Casey's description :

"*Brennus insularis*, n. sp.—Elongate, rather feebly ventricose, shining throughout, black throughout the body and legs, the elytra rather dusky cupreo-violaceous, with narrow and bright aeneous side margins. *Head* rather stout, moderately elongate, the vertex almost smooth, the broadly impressed transverse nuchal constriction rather pronounced; genæ feebly developed, with the angular notch small and inconspicuous; supra-orbital ridges moderately strong and inwardly inclined at the antennæ, fine posteriorly; antennæ slender, moderate in length, the basal joint distinctly thicker, claviform, not as long as the next two, the seta at apical eighth. *Prothorax* well developed, scarcely as long as wide, moderately dilated and broadly rounded throughout anteriorly, the sides not more strongly rounded before, but becoming gradually oblique behind; the middle, to the base, with a scarcely visible ante-basal sinuation; angles much more than right, and bluntly rounded; base wide, more than half the maximum width and fully as wide as the head; disk feebly convex, the median line strong; sublateral impressions deep, extending far before the middle; reflexed margins rather fine. *Elytra* elongate-elliptical, fully half longer than wide, nearly three and a half times as long as the prothorax and two and a third times as wide; humeri evenly and obliquely rounded; reflexed margins ample but rather finely punctate; disk strongly, evenly convex, the striæ deep and broadly impressed, rather uneven, obscurely punctate, readily traceable throughout the width, the intervals convex, much broken up toward the sides and finely so toward the apex. Legs very slender. Length 17.5 mm.; width 6.8 mm.

"Queen Charlotte Islands. [This is an error. See above.—J. H. K.]

"This fine species is founded upon a single perfect specimen recently sent to me by Mr. Fletcher and probably taken by Mr. Keen. It is a female, but the species will be readily known from *marginatus* by its much larger size, more elongate and convex elytra, larger and less posteriorly narrowed prothorax, with the sides less sinuate toward base, and several other characters."

## NOTE ON THE DIURNALS.

BY A. RADCLIFFE GROTE, A. M., ROEMER MUSEUM, HILDESHEIM.

*Mancipium brassicae*.—Dr. Chapman writes me that certain specimens of this common species examined by him showed the very short veinlet III. 3 + 4. This veinlet constantly diminishes in size, progressing towards the tip of the wing to finally vanish, through many forms of the *Pierida*. I had indeed expected it to be occasionally persistent in *brassicae*, although my preparations did not show it. It has disappeared in *Pontia daplidice*, in *Nathalis iole*, and, strange to say, in that curious and now isolated Pierid, *Gonophlebia paradoxa*. This variability, in one and the same species, is interesting because it follows the general evolutionary direction of the changes in the venation. Always the radial branches in the Pierids and other groups tend to diminish in number. Always the disintegration of the Media advances, until it finally disappears, as a system, from the surface of the wing (*Rothschildia*, *Samia*, *Potamis*, etc.). A parallel case to that of *brassicae* is offered by *Copismerinthus ocellata*. In some specimens of this Hawk Moth, vein IV, is still thrown off from the cross vein of the hind wings, instead of the Radius, which it has usually ascended to beyond the cell. We must regard these as instances of generalization in the individual, of a reversion to what was formerly the rule and is now becoming, by slow degrees, the exception. Mr. Scudder kindly informed me that he believed that slight structural differences in all stages of *brassicae* could be demonstrated as compared with the type of *Pieris*. In my studies I am mainly concerned with the correct use of generic names extant in literature, without attempting to judge of the comparative value of such differences; if any characters can be found I take them as generic if a title exists in literature. We may reasonably regard *Mancipium* as a development of *Pieris* since it shows a further progress upon the same structural lines. I have tried to show that *Pontia* presents a parallel advance, but upon a distinct phylogenetic terminal line, belonging to the *Anthocharini* and not to *Pieris* as heretofore classified. The five-branched Radius of *Euchloe stella* has been reduced to four in *Tetracharis cethura*, to three in *Pontia daplidice*, which retains the *Anthocharid* pattern and shape of wing.

*Eumargareta coresia*.—I have recently studied this South American Nymphalid, which belongs taxonomically to the *Nymphalinae*, but differs by position of the last radial branches, and can hardly be a member of the phylogenetic group to which *Limenitis* and *Nymphalis lucilla*

belong, and which embraces also *Basilarchia*. Mr. W. F. Kirby writes me that he cannot find that any new name has been proposed for *Megalura*, Blanchard, 1840, preoccupied by Horsfield, 1820, and Agassiz, 1833. (See Scudder, Historical Sketch, 212.) I have accordingly proposed the above generic title for the type *coresia*. What is relatively unimportant at the present time seems to be a discussion of rules limiting the application of the law of priority, all of which are arbitrary in their nature and cannot compel universal consent. What appears to me of greater practical value is the fixing of the types of existing generic titles, so that the use of these by themselves, without mention of any species, may be intelligible. The discord is already such that much of what has been recently written by the systematists on the Diurnals cannot be followed or clearly understood.

*Issoria lathonia*.—This is a distinct genus from *Argynnis aglaie*, in which type vein  $III_2$  is appressed upon the Radius to a point beyond the cell, while really arising at a point within the cell. In *Issoria* this appression, which prepares us for the point of emission of vein  $III_2$  in *Melitæa*, has not taken place. In *Issoria*, vein  $III_2$  is brought nearer than in *Brenthis hecate*. These two types, *Issoria* and *Brenthis*, appear more generalized than *Argynnis*. Both in *Dryas paphia* and in *Acidalia niphe* the appression has taken place as in *Argynnis*, and I am at a loss to distinguish the genera from the neurulation. In the more specialized *Agraulis* all the branches arise beyond the cell. With the lengthening of the wing the radial veins tend to arise beyond the cell and reproduce the character found in *Leptidia* and other "long-wings." In *Dione iuno*, vein  $III_1$  has not progressed so far beyond the cell as in *Agraulis vanilla*. In *Euptoieta claudia*, vein  $III_1$  has not reached the extremity of the cell; the cross vein is nearly vanished on hind wings between  $IV_2$  and cubitus, a specialization in the direction of *Melitæa*. In *Euphydryas phaeton* the only deviation from the *Melitæa* type is the very slightly more strongly retained cross vein on primaries. This is hardly noticeable, and I am at a loss to distinguish the genus by the neurulation from *Melitæa maturna*. I can also not distinguish *Cinclidia*. The genera *Acidalia*, *Dryas*, *Euphydryas* and *Cinclidia* do not afford neurulation characters by which they may be distinguished, the two first from *Argynnis*, the two latter from *Melitæa*. In *Phyciodes tharos*, vein  $III_1$  springs from Radius before extremity of cell; vein  $III_2$  as in *Melitæa*; vein  $III_4$  decidedly to apex of wing, as frequently



occurs in the group of *Argynnini*. It has the *Melitæa* specialized character of the open cell on secondaries, but in the type of *Melitæa* vein III, does not attain apex of wing, but falls below it. The *Melitæini* are more specialized as a group than the *Argynnini*. This latter seems on the whole the generalized group of the *Nymphalidae* proper, and from the ancestors which the modern Fritillaries represent may have sprung the holarctic *Argynnina*, and from these the *Nymphalina*. But the latter are, perhaps, not monophyletic; at least the West South American *Eumargaretæa* excites doubts which do not arise from a study of the South American genus *Adelpha*, which latter, no doubt, belongs phylogenetically with the Old World *Athyma*, although the pattern differs. The definition of the *Nymphalina* by the taxonomic character of the coalescence of veins II. and III. of the hind wings up to the point of the almost stationary I. (the "præcostal spur" of some writers) probably throws together butterflies which have reached this specialization by different routes.

*Morphina*.—My study of *Morpho* leads me to believe that the group has sprung from the Satyrid stem. It has attained the grade of specialization of *Melitæa*, the cell on hind wings open. It would seem that these butterflies are specialized *Agapetidae*, which have assumed the habit of a more lofty flight. As a rule, the "tree" butterflies and moths seem more specialized, and have probably everywhere appeared later upon the scene.

#### CONCERNING XANTHORHOE GLACIALIS, HULST.

Dr. Hulst describes the species and *X. longula* in May CAN. ENT., p. 119. The National Museum has a long series of these (225 specimens), very variable, but doubtless representing only a single species. In spite of the label, I am of the opinion that Dr. Hulst's types are not American specimens. Some bear a printed label "Alaska" and "Coll. C. V. Riley"; others have a written label "Behring Island, Alaska"; and others "Behring Island." I think the whole series were collected by Dr. Stejneger at Behring Island, which is one of the Commander Islands off the coast of Kamchatka, and has in general an Asiatic fauna. It is unfortunate that these seductive little "Alaska" labels were used on the specimens. However, the species is evidently American if the type specimens are not, for we have one labelled "Aleutian Islands, Turner, 1881," and another that I take to be the same (a ♀, and rubbed), from "Nushagak River, Alaska, Aug. 14, 1881, McKay collector."

HARRISON G. DYAR.

## DEIDAMIA INSCRIPTA, HARR.

In the early part of May last, on meeting Mr. Bice he had the agreeable information to convey to me that he had taken a Sphinx that was new to him. Upon looking at it I at once suspected that it was new to me also; and on investigation proved the correctness of the impression. Its small size, strikingly Smerinthoid form of primaries, peculiar olive-gray colour and distinctly outlined ornamentation made it easy to determine.

Prof. Fernald gives, in his "Sphingidæ of New England," the following brief, but clear and unmistakable, description of the species:

"Expanse of wings, two inches. The head and thorax are grayish-brown, with a double, curved, white line, edged with brown across the prothorax, behind which are two other curved lines, one on the middle and the other on the hinder part of the thorax. The abdomen is ashy, and has two rows of dark brown spots. The fore wings are ashy-gray at base, in the middle and toward the apex. Three brownish bands cross the wings before the middle, another angulated band crosses beyond the end of the cell, and the outer border of the wing has two dark brown lunules on the margin below the apex, before the second of which is a third spot, with more or less white between. The discal spot is paler than the ground colour of the wing. The hind wings are of a dull reddish-brown colour, with a dusky terminal band, which grows narrow toward the anal angle. Fringes white. The mature larva is two inches long, of a fine green colour, and the body tapers from the third segment toward the head. The caudal horn is whitish at the tip. They go into the ground (not very deep), and transform into very dark brown pupæ, with the tongue-case a short elevated ridge; a short central spine at the end of the head and a spinous tubercle on each of the eye-cases. Feeds on the leaves of grape and Virginia creeper."

Mr. Grote says: "No known Smerinthoid feeds on the grape." He gives the habitat as "Canada to Virginia." To which Dr. J. B. Smith adds, "Westward to the Mississippi Valley." He also says, "The species is by no means common." It is figured in Strecker's Lep. Rho. et. Het., Plate XIII., Fig. 8.

This is the fourth Sphingid species that Mr. Bice has secured new to the Society's collection.

J. ALSTON MOFFAT, London, Ont.



# CLASSIFICATION OF THE HORNTAILS AND SAWFLIES, OR THE SUB-ORDER PHYTOPHAGA.

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(Paper No. 3.)

## FAMILY V.—XYELIDÆ.

No species seems to be known in this family outside of the European and North American faunas, and very few species are described. The group was first treated as a subfamily by Newman as early as 1834.

The imagoes appear very early in the year, or in February, March and April, deposit their eggs and then disappear, the consequence being that very few are taken and only a few of the commoner forms are known. With more careful collecting early in the season, however, the probabilities are that many more species will be discovered in our fauna.

The imagoes of three distinct species of these insects, representing as many genera, have been bred recently from the larvæ by Dr. H. G. Dyar, and we are not only indebted to him for the first authentic life-history of a species in this group, but also for the first scientific description of the larva. His recent discovery of a large undescribed species in the rare genus *Pleuroneura* was most unexpected.

The known genera seem to fall into two well-marked natural groups, distinguished by differences in both the front and hind wings, and which are here treated as subfamilies.

### Table of Subfamilies.

- Front wings with the intercostal vein separated, not uniting with the subcostal; hind wings with two complete submarginal cells and one discoidal cell; ovipositor hardly half the length of the abdomen.....Subfamily I., Macroxyelinæ.
- Front wings with the intercostal vein uniting with the subcostal; hind wings with one complete submarginal and one discoidal cell; ovipositor as long or longer than the abdomen.....Subfamily II., Xyelinae.

### Subfamily I.—MACROXYELINÆ.

The imagoes of this group are very much larger than those in the *Xyelinae*, and are readily distinguished by the distinctly separated intercostal vein, as in the *Lydinae*, and their much shorter ovipositor, while their larvæ seem to be strictly external feeders.

The genera now known may be separated as follows :

Table of Genera.

- Antennæ 10-12 jointed.....2.  
 Antennæ 9-jointed, the six terminal joints very short, together not longer than the scape and less than half the length of the third joint ; clypeus with a median emargination ; claws with an erect tooth before tip.....*Macroxyela*, Kirby.  
 2. Clypeus anteriorly triangularly produced at the middle ; all tibiæ very spinous, the hind tibiæ with four lateral spurs beneath.  
     Claws cleft ; antennæ 10-11 jointed (the tenth sometimes divided into two joints), the seven or eight terminal joints very short, together not longer than the scape or less than one-fourth the length of the third joint ; only one transverse radial nervure joining the second cubital cell. *Megaxyela*, Ashm.  
     Claws with a large erect tooth before the middle ; antennæ 12-jointed, the nine terminal joints much shortened, together much shorter than the third joint ; both transverse radial nervures joining the second cubital cell.. *Pleuroneura*, Konow.

Subfamily II.—XYELINÆ.

The species at present known in this group are very small and are readily distinguished by having the intercostal vein united with the subcostal, by having only one complete submarginal cell in the hind wings, and by the longer ovipositor. Their larvæ are apparently internal feeders.

Only two genera are known, separated as follows :

Table of Genera.

- Antennæ 12-jointed, the nine terminal joints slender, lengthened, together as long or longer than the third joint ; claws long, slender, with a very minute, nearly obsolete, tooth beneath, a little beyond the middle.  
 Front wings with both transverse radial nervures received by the second cubital cell, rarely with the second transverse radius interstitial ; clypeus with a median ridge, which is slightly extended beyond the anterior margin, but scarcely triangularly produced.....*Manoxyela*, Ashm.  
 Front wings with the first transverse radial nervure received by the second cubital cell, the second transverse radius received by the third cubital cell ; clypeus anteriorly triangularly produced medially.....*Xyela*, Dalman.

## FAMILY VI., LYDIDÆ.

The genera in this family have been revised recently by Mr. F. W. Konow,\* who treats the group as a tribe, dividing it into two subtribes, (1) *Megalodontides* and (2) *Lydides*. He recognizes eight genera, but some of these he again divides into subgenera.

Believing that these insects represent a distinct family, I have here recognized his subtribes as subfamilies, and his subgenera as genera.

In my table of families I overlooked the fact that the *Megalodontides* (exotic species) had no distinct intercostal vein, so that line 2, page 144, should be amended to read: Costal cell most frequently with an intercostal cell.

The following tables are based mainly upon those of Konow's, although I have made some changes, and used some characters not mentioned by him, which, it is believed, will render the genera much more readily distinguishable. All of them are known to me, except *Melanopus* and *Tristactus*.

## Table of Subfamilies.

Head usually without the two longitudinal grooved lines on the vertex, or with only traces of them; antennæ with the middle joints depressed or concave beneath, with more or less distinct branches or processes; front wings without an intercostal vein, or it is only indicated by a streak; cubitus originating from the middle of the basal nervure; second dorsal segment of abdomen entire, without a median slit.....Subfamily I., *Megalodontinæ*.

Head always with two distinct longitudinally grooved lines on vertex; antennæ filiform, simple; front wings with an intercostal vein; cubitus originating from the apex† of the basal nervure or from the costal vein; second dorsal segment of abdomen emarginate or with a median slit.....Subfamily II., *Lydinæ*.

## Subfamily I.—MEGALODONTINÆ.

This group or subfamily, so far as I know, has no representative in our fauna. It is more particularly confined to the Asiatic fauna, a few species only being found in Europe, while but a single species has been recorded from Africa.

\*Annalen des K. K. Naturh. Hofm., XII., 1897, Heft I.

†Konow says from the *base*, but in this he is in error, since the basal nervure in reality represents a fork of the median vein and originates from that vein and not from the subcostal vein, as his language would seem to imply.

It is quite probable, however, that species will yet be discovered in our fauna, especially in the unexplored regions of Alaska and British Columbia.

The four genera recognized by Konow may be distinguished by the aid of the following table :

Table of Genera.

Flagellum with joints 2-13 of an unequal length, gradually decreasing in length, the middle joints without long, compressed, subfoliaceous processes. . . . . 2.

Flagellum with joints 2-13 of an equal length, or nearly so, the middle joints with long, compressed, subfoliaceous processes or branches.

Process of the first flagellar joint at least as long as the two following joints united, or longer; penultimate antennal joint longer than the second. . . . . *Rhipidioceros*, Konow.

Process of the first flagellar joint shorter than the two following joints united, usually shorter than the second joint; penultimate antennal joint shorter than the second. . . . . *Megalodontes*, Latreille.

2. Antennæ at least 20-jointed; joints 4-9 in ♀, 3-13 in ♂, at apex obliquely truncate and somewhat produced, but with each process compactly united with the following; the penultimate joint of labial palpi shortened, triangular. . . . . *Melanopus*, Konow.

Antennæ 13-14-jointed; joints from fourth and beyond triangular, almost truncate at apex; penultimate joint of maxillary and labial palpi triangular, much shorter than the last. . . . *Tristactus*, Konow.

Subfamily II.—LYDINÆ.

This subfamily is at once distinguished from the *Megalodontinæ* by always having two parallel, deeply impressed lines on the vertex, and by the distinct intercostal vein in the front wings.

All of our species, so far discovered, belong in this subfamily, and all of the genera, tabulated below, occur in our fauna, except *Caenolyta* and *Gongylocorisa*.

The genera may be easily distinguished by the aid of the following table :

Table of Genera.

Claws cleft. . . . . 3.

Claws not cleft, but with a small median or subapical tooth.

Anterior tibiæ without a lateral spur before apex. . . . . 2.

Anterior tibiæ with a lateral spur before apex.

- Temples immargined; second transverse cubitus interstitial with the transverse radius.....*Lyda*, Fabr.
- Temples, at least below, sharply margined...*Itycorsia*, Konow.
2. Basal nervure uniting with the cubitus near its base; second transverse cubitus interstitial with the transverse radius or joining the radius a little *beyond* it ..... *Cephaleia*, Panzer.
- Basal nervure uniting with the subcostal vein in the angle formed by the cubitus; second transverse cubitus uniting with the radius *before* the transverse radius ..... *Cænolyda*, Konow.
3. Intercostal vein forked at apex, the outer branch attaining the costal vein, the inner branch joining the subcostal vein and thus forming two closed basal cells.....4.
- Intercostal vein with only the outer branch of the fork, therefore only one closed basal cell; basal nervure joining the cubitus near its middle.
- Temples posteriorly rounded; transverse median nervure present; third antennal joint very long, as long as joints 4-9 or 10 united.....*Gongylocoris*a, Konow.
- Temples posteriorly sharply margined; transverse median nervure absent; third antennal joint not or scarcely longer than joints 4-6 united.....*Neurotoma*, Konow.
4. Basal nervure joining the cubitus near its base.....5.
- Basal nervure joining the subcostal vein at the origin of the cubitus or in the angle formed by it; first joint of flagellum scarcely as long as joints 2-3 united; temples acutely margined.....*Kelidoptera*, Konow.
5. First joint of flagellum not or scarcely longer than the second, or at least always much shorter than joints 2-3 united; temples margined.....*Pamphilus*, Latreille.
- First joint of flagellum as long or longer than joints 2-3 united; area of vertex always longer than wide.
- Head punctate, the temples margined; second transverse median nervure always received by the first discoidal cell *beyond* its middle.....*Bactrocero*s, Konow.
- Head polished, impunctate, the temples rounded behind, immargined; second transverse median nervure received by the first discoidal cell *at* or *before* the middle ..... *Liolyda*, Ashm., n. g.
- (Type *L. frontalis*, Westw.)

## FAMILY VII.—HYLOTOMINÆ.

All the species belonging in this group or subfamily have always 3-jointed antennæ, the third joint in the female being simple, while in the male it is most frequently forked. Sometimes it is simple in the male as in the female, but in this case, however, it is as a rule more pointed at apex and more densely pubescent.

The 3-jointed antennæ readily distinguish the family, and must always be depended upon, since otherwise it approaches, in its thoracic and abdominal characters, very close to the *Lophyridae*, *Perreyiidae* and the *Selandriidae*.

Since formulating my table for distinguishing the families I have discovered a new genus without an anal cell.

The family may be divided into two subfamilies as follows:

## Table of Subfamilies.

Front wings without a transverse nervure in the costal cell.....	Subfamily I., Schizocerinae.
Front wings with a transverse nervure in costal cell.....	Subfamily II., Hylotominae.

## Subfamily I.—SCHIZOCERINÆ.

This subfamily is readily distinguished by the absence of a costal transverse nervure. It comprises by far the greater number of genera and species, and is widely distributed throughout the globe, the species found in the tropics being especially handsome.

The numerous genera may be easily recognized by the aid of the following table:

## Table of Genera.

Marginal cell appendiculate.....	6.
Marginal cell not appendiculate.	
Front wings with three submarginal cells.....	5.
Front wings with four submarginal cells (rarely with the first transverse cubitus subobsolete).....	2.
2. Lanceolate cell petiolate, the small cell at base obliterated by the short anal vein uniting with the median.....	3.
Lanceolate cell longly contracted, nearly petiolate, but always with a small closed cell at base.	
Second submarginal cell receiving both recurrent nervures, or the second recurrent is interstitial with the second transverse cubitus.....	4.



Second and third submarginal cells each receiving a recurrent nervure.

Head seen from in front usually much broader than long; ♀ antennæ slender filiform, ♂ furcate.

Hind wings without an anal cell. *Sericocera*, Brullé.

Hind wings with an anal cell. . . *Schizocera*, Latreille.

Head seen from in front not or scarcely broader than long; second submarginal cell along the radius not longer than the third; hind wings with two discal cells; ♀ antennæ subclavate, ♂ furcate. . . *Cyphona*, Dahlbom.

3. Second submarginal cell much longer than the third, the latter quadrate; ♀ antennæ filiform, ♂ furcate. . . . . *Schizocera*, Latreille.
4. Second submarginal cell receiving the first recurrent, the second recurrent interstitial with the second transverse cubitus; middle and hind tibiæ with a lateral spur. . . . . *Scorbina*, Lepel.
4. Second submarginal cell receiving both recurrent nervures; middle and hind tibiæ without lateral spurs; hind wings with two discal cells; mandibles simple. . . . . *Pseudocyphona*, Ashm.,\* n. g.
5. First submarginal cell receiving both recurrent nervures. *Themos*, Norton.  
First and second submarginal cells each receiving a recurrent nervure. . . . . *Schizocera*, Latr.  
= *Atomocera*, Say.  
= *Sphecophilus*, Prov.
6. Front wings with four submarginal cells; if with three, which occurs only in a single genus in the ♂, the second transverse nervure wanting. . . . . 9.
- Front wings with three submarginal cells, the first transverse cubitus wanting.  
First and second submarginal cell each receiving a recurrent nervure. . . . . 7.  
First submarginal cell receiving both recurrent nervures; hind wings with two discal cells, the first (in reality the first submarginal) about twice as long as the second. . . *Dielocerus*, Curtis.  
Second submarginal cell receiving both recurrent nervures. . . . . *Topotritia*, Kirby.
7. Middle and hind tibiæ with a lateral spur. . . . . 8.

\* Type *P. Mexicana*,

Middle and hind tibiae without a lateral spur; hind wings with two discal cells, the first much larger than the second.

Hind wings with a lanceolate cell.....*Ptilia*, Lepel.  
(= *Didymia*, Lep.)

Hind wings without a lanceolate cell.....*Gymnia*, Spinola.

8. Hind wings with two discal cells, the first much smaller than the second, the anal cell present.....*Trichorhachus*, Kirby.

9. Second submarginal cell receiving two recurrent nervures, or the second recurrent is interstitial.....11.

Second and third submarginal cell each receiving a recurrent nervure; hind wings with two discal cells.

Hind and middle tibiae with lateral spurs.....10.

Hind tibiae without lateral spurs.

Third submarginal cell much shorter than the second; hind wings without an anal cell.....*Hemidianura*, Kirby.

Third submarginal cell as long as the second or nearly so; hind wings with an anal cell.....*Athermantus*, Kirby.

10. Third submarginal cell shorter than the second; hind wings with an anal cell.....*Caloptilia*, Ashm., n. g.  
(Type *C. Townsendi*, Ashm.)

11. Hind tibiae with apical spurs.....12.

Hind tibiae without apical spurs.

Head large, quadrate, the temples full and very broad; mandibles acute at tip; tarsal joints very short, joints 2-5 transverse.....*Pachylota*, Westwood.

12. Second submarginal cell receiving both recurrent nervures; middle and hind tibiae without lateral spurs.....13.

Second submarginal cell receiving only one recurrent nervure, the second recurrent interstitial.

Middle and hind tibiae with a lateral spur; third submarginal cell much larger than the first and much broader at apex than the second.....*Acanthoptenos*, Ashm., n. g.

(*A. Weithii*, Ashm.)

13. First and third submarginal cells rather small, subequal, the second elongate, the third quadrate or nearly so.

Claws simple.....*Ptenos*, Norton.

Claws bifid.....*Nematoneura*, André.

Third submarginal cell along the radius as long as the second, along the cubitus only half its length, the third transverse cubitus strongly curving outward and then upward; marginal cell broadly truncate at apex, so that with the long appendage it appears almost two-celled; hind wings with two discal cells, the second only about half the length of the first; claws cleft. ♂ with only three submarginal cells, the transverse cubitus entirely wanting, antennæ furcate..... *Neoptilia*, Ashm., n. g.

(Type *N. mexicana*, Ashm.)

#### Subfamily II.—HYLOTOMINÆ.

This group closely resembles the former, but the presence of a short transverse nervure in the costal cell readily distinguishes it. It is a character common in the families which are to follow, and its position and shape or direction appears to be of great taxonomic value.

The genera recognized may be separated as follows:

#### Table of Genera.

Marginal cell appendiculate ..... 3.  
Marginal cell not appendiculate ..... 2.

2. Front wings with three submarginal cells, the first and second each receiving a recurrent nervure; middle and hind tibiæ without a lateral spur; third antennal joint in ♂ furcate... *Micrarge*, Ashm., n. g.

(Type *A. ruficollis*, Nat.)

3. Cubitus originating from the apex of the basal nervure or in the angle formed by it and the subcostal vein..... 4.

Cubitus originating from the subcostal vein more or less remote from the apex of the basal nervure.

Front wings with four submarginal cells, the second and third each receiving a recurrent nervure..... *Hylotoma*, Latreille.

(Section I.)

4. Front wings with four submarginal cells, the second and third each receiving a recurrent nervure.

Hind wings with a lanceolate cell; middle and hind tibiæ with a lateral spur..... *Hylotoma*, Latreille.

(Section II.)

Hind wings without a lanceolate cell; middle and hind tibiæ without a lateral spur..... *Gymniopterus*, Ashm., n. g.

(Type *G. singularis*, Ashm.)

DESCRIPTIONS OF NEW GENERA AND SPECIES OF THE  
GEOMETRINA OF NORTH AMERICA.

BY GEO. D. HULST, BROOKLYN, N. Y.

(Continued from page 195.)

## SELIDOSEMA NIGRESCENS, n. sp

Expands 31-33 mm. Palpi and front dark fuscous; antennæ black above, fuscous below; thorax dark fuscous, patagiæ lighter; abdomen dark even fuscous. All wings dark fuscous, made by heavy coalescing striations of fuscous and blackish on a light fuscous ground; basal line black, quite distinct, rounded, wavy; a median shade passing through distinct black discal spot; an outer black distinct cross line, continued across hind wing, on fore wing sinuous, subparallel with outer margin, on hind wing nearly or quite straight; on fore wing beyond this line is a broad reddish-brown band, not always clear, however, sometimes showing faintly at middle of hind wing; a submarginal row of light, not distinct, lunules, edged within with darker; marginal lines black, distinct. Beneath fuscous, with faint line shadows, and a dark shadow spot near apex of fore wings.

San Antonio, Texas. The generic reference is provisional, as all the specimens before me are females.

## CONIODES PLUMIGERARIA, Hulst.

This insect was described from the ♂ only as *Boarmia plumigeraria*, Ento. Am. III., 216, 1887. In Bull. No. 7, new series, U. S. Dept. Agric., p. 64, 1897, Mr. Coquillett publishes a life-history of the insect, and gives us the information, apart from larval history, that the female is wingless. I have received a specimen of the ♀ from the National Museum collection, which I herewith describe.

Palpi short, rather light, separate, black or blackish-gray; front broad, black with a few gray scales; tongue very short, weak; thorax blackish-gray, short, rather stout; abdomen blackish-gray, very short and heavy; antennæ filiform, blackish-gray, loosely scaled; wings undeveloped, about as long as the thorax, blackish-gray, though lighter than thorax and abdomen; legs blackish-gray, rather long, slender, hind tibiæ with two pairs of spurs; the abdomen is armed with chitinous spines, not very stout, quite numerous over the whole segment, but hidden in the covering scales. Upon closely examining the male I find that it also has the abdomen armed with spines as in the female.

The insect, by the wingless female and as well the abdominal armature, is allied very closely to the genera of the *Phigalia* group. The genus *Coniodes* is, however, sufficiently distinct from *Rhaphidodemas* in the almost obsolete tongue and the male antennæ pectinated to the tip.

*PHENGOMMATÆA DISSIMILIS*, n. sp.

Expands 33 mm. Palpi and front white; thorax and abdomen white; all wings above and below of an even, smooth cream white, the fore wings above being of a somewhat deeper shade.

Glenwood Springs, Colo.; from Dr. Barnes.

*RIPULA VESTALIS*, n. sp.

Expands 40-42 mm. Palpi whitish below, black above; front black, or white below, black above, thorax, abdomen and all wings, above and below, pure, unbroken, silky white; antennæ fuscous, fore and middle legs black at end of femora, otherwise pure white, except some black on tibial epiphysis of fore legs.

South Florida; from Mrs. A. T. Slosson.

*THERINA PUNCTATA*, n. sp.

Expands 42 mm. Palpi very short, fuscous; front fuscous ochre, bright reddish ochre at summit; thorax, and abdomen light fuscous ochre; fore wings ochre, with fuscous striations, veins with an orange-ochre shade; inner line of blackish points, not distinct; outer line of black points, with an outer orange shading, sinuous, subparallel with outer margin; discal spot faint; hind wings ochre, with faint cross line; beneath even ochre yellow with fuscous tinge, lines and spots obsolete.

Glenwood Springs, Colorado; from Dr. Barnes. Near *T. vitrina*, Grt., but much larger, wings more extended, much more thickly scaled, and outer line much more sinuous.

*NEOTERPES EPHELIDARIA*, var. *Kunzei*, n. var.

I have received from Dr. Kunze a number of specimens of *N. ephelidaria*, Hulst, in which the whitish colour of the fore wings is replaced with yellow, varying somewhat in brightness. The specimens vary also in the lines, in the most these being quite evident as in *N. ephelidaria*, but in some specimens they are almost obsolete. In one case the fore wings approach *N. Edwardsata*, Pack., in appearance in some of its lighter marked forms. It may, therefore, be a variety connecting the two species.

*EUGONOBAPTA CONSTANS*, n. sp.

Expands 32 mm. Palpi fuscous, tipped with white; front gray; thorax and abdomen clay colour, the latter more ochreous; fore wings broad, falcate, angulate at vein 4, dull clay colour, more or less stained and striated with fuscous, this darkening into a rounded indeterminate basal band, and a better marked, though still indefinite, outer band running nearly to apex; margin ochre-clay colour; hind wings strongly angled at vein 4, of the same colour as fore wings, outer band continued from and like that of fore wings, and a faint submarginal shading; discal spots on all wings of dark points; beneath as above, the colours sharper, and the lines somewhat more determinate.

Prescott, Ariz.; from Dr. Kunzé; taken Aug., 1896.

*EUGONOBAPTA OCHREATA*, n. sp.

Expands 33 mm. Size and shape of *E. constans*, Hulst. Colour bright ochre, clear and even; inner line reddish-ochre, faint; outer line reddish-ochre, fine, subparallel with margin; beyond outer line a row of blackish blotches; hind wings colour of fore wings, outer line the same, nearly straight, and at middle of wings, with two or three blackish blotches beyond towards inner margin; beneath bright ochre, outer line scarcely showing, the blotches obsolete.

Senator, Ariz.; from Dr. Kunzé; taken Aug. 20, 1896.

*SLOSSONIA*, n. gen.

Palpi long, extended, beaklike; tongue very short, weak; front tufted; antennæ bipectinate in ♂, apex simple, serrate in ♀; thorax and abdomen untufted; fore tibiae unarmed; hind tibiae swollen, without hair pencil, with two pairs of spurs; fore wings angulate in ♂, rounded and subfalcate in ♀, without fovea below in ♂; 12 veins: 3 and 4 separate, 5 near middle of cell; 6 separate from 7; 10 and 11 from cell separate from 9 and 12; hind wings, 5 obsolete, 6 and 7 separate, 8 separate from cell. Type *S. rubrotincta*, Hulst.

The ♀ of the type is wanting; the determination of the ♀ is from *S. latipennis*, Hulst, which, as the ♂ is not known, may not belong here.

This generic name is with very great pleasure given in honour of Mrs. Annie Trumbull Slosson, of New York, who has not only added very greatly to our knowledge of the American insect world, especially of Southern Florida and the White Mountains of New Hampshire, but has herself also done some excellent descriptive and critical work. To this I



may add my appreciation of her charming personality, of her high standing as an author in the literary world, and of her very large generosity in favours which are personal to myself.

*SLOSSONIA RUBROINCTA*, n. sp.

Expands 30 mm. Palpi bright ochreous, tinged on sides by reddish-purple; front ochreous; antennæ ochreous, tinged at base above with reddish-purple; thorax and abdomen light clear ochre. Fore wings broad, angled on outer margin at vein 4, clear light ochre with purple-red stain at base, on costa, and two purple-red costal stains marking the beginning of otherwise obsolete cross lines; apex more yellow. Hind wings angulate at vein 4, broad, light clear ochre; discal spots and marginal lines obsolete. Beneath in colour as above, the hind wings sparsely dotted in the blackish scales, thickening to a diffuse black spot along inner margin. All legs ochre, stained especially on tibiae with purple-red.

Los Angeles Co., Cal.; taken in July; type in National Museum, No. 3943.

*SLOSSONIA LATIPENNIS*, n. sp.

Expands 33 mm. Palpi long, slender, ochreous, tipped with black; front ochre; thorax yellowish; abdomen ochre-white; fore wings broad, even, rounded, ochreous, stained with yellow at base, a faint edging of blackish basally on costa, and a faint indication of a straight oblique whitish line beginning at costa close to apex. Hind wings ochreous, a little yellow stained on middle portion, with a faint, somewhat rounded line as on fore wings; discal spots fine, jet black; all wings very broad, the hind wings with especially long inner margin and distinct posterior angle. Beneath all wings light ochreous, the fore wings somewhat yellow at base and apex, discal spots black, some black scales on hind wings between discal spot and inner margin; legs as far as seen whitish-ochreous, with tibiae stained with black.

Cocoonut Grove, S. Fla. Type in National Museum, No. 3956.

*SYNTAXIS FUSCATA*, n. sp.

Expands 48 mm. Palpi dark fuscous; front whitish; thorax ochreous fuscous; abdomen fuscous; fore wings dirty fuscous, between the cross lines darker, forming a cross band; discal spots black; hind wings fuscous except along fore margin; cross line broad, not strongly marked, reaching from inner margin half across wings, discal spots black.

Beneath lighter fuscous, more even, the hind wings more loosely striated, and all with more of an ochreous tinge.

Glenmore Springs, Colorado; from Dr. Barnes; taken between Sept. 16 and 23.

*ENNOMOS OCHREATUS*, n. sp.

Of the size and shape of *E. magnarius*, Guen., but of an even bright ochre colour, scarcely darkening into darker ochre along outer margin and faintly on outer line, the colour being almost exactly the same below. This may be an extreme variety of *E. magnarius*, of which I have received a number of specimens from Colorado and Utah, but all these, though lighter than the Eastern form, have the lines distinct and the colours deeper and are quite uniform.

Colorado; from Dr. Gillette.

*METANEMA SUBPUNCTATA*, n. sp.

Expands 32 mm. An insect of the size and shape of *M. excelsa*, Streck., with the ground colour of fore wings white, heavily overlaid with fuscous striations, which have a violet tinge; lines as in *M. excelsa*, edged with fuscous, the basal on the outside, the outer on the inside; outer margin brownish; hind wings stained whitish. Beneath in colour much as above, the fore wings less striated; the hind wings much more. California.

*MARMAREA PEPLARIOIDES*, n. sp.

Expands 43 mm. An insect comparing with *M. occidentalis*, Hulst, much as *Azelina peplaria*, Hub., compares with *A. hubnerata*, Gn. The general colour is a bright bluish-mouse colour, the base darker, the middle field a broad bluish-black band; discal spot white; outer line of hind wings whitish with an inner edging of blackish. Beneath bluish, the hind wings much striated. It may be, and indeed probably is, a variety of *M. occidentalis*, though decidedly different in appearance.

San Francisco Mts., Ariz.; from Dr. Kunzé; taken July 23rd, 1897.

*STENASPILATES INVIOLOATA*, n. sp.

Of the size and general appearance of *S. radiosaria*, Hulst, but the colour is pure white, overlaid with an even light fuscous tinge. The basal line is wanting, the outer line is white, edged within with fuscous, nearly straight, and on all wings. Hind wings white at base, fuscous tinged outwardly; abdomen clay white; beneath as above.

Phoenix, Ariz., May 30th; from Dr. Kunzé. Very much lighter in colour than *S. radiosaria*, and differing in the ground colour entirely.

*CABERODES MINIMA*, n. sp.

Expands 28 mm. Palpi white, with a few scattered black scales intermixed; front white, tinged with fuscous; antennæ fuscous; thorax and abdomen light fuscous, the abdomen with some black scales; fore wings light fuscous ochre, with scattered blackish scales and striations; basal cross line rounded, not prominent; outer cross line heavy, black, nearly parallel with outer margin, a little emphasized on the veins; a slight costal spot near apex; discal spot large, prominent, black, with a slight central ochre point; hind wings white, faintly fuscous stained, with scattered fuscous scales, outer line broad, dark, parallel with outer margin; discal spot apparent, but not prominent. Beneath of the ground colour above, with outer lines and discal spots of all wings present but faint.

Arizona; quite different in appearance from the ordinary *Caberodes*.

## NOTES ON CHLOROTETTIX, WITH SOME NEW SPECIES.

BY C. F. BAKER, AUBURN, ALA.

✓*Chlorotettix unicolor*, Fitch.—An examination of the Fitch type in the National Museum shows this to be the form described by Mr. Van Duzee as *galbanata*. As this will leave Mr. Van Duzee's *unicolor* without a name, it may be known as *Vanduzei*. *Vanduzei* differs from all the other described species in a character not before noted,—the ocelli are distant from the eyes,—while in all the others they are about as near as their own width or nearer. Differing thus widely from other species referred here, *Vanduzei* must still remain the type of the genus, which should perhaps be used for it alone. The male of *unicolor*, Fh., closely resembles in genital characters that of *spatulatus* which I have from Kansas and Texas.

✓*Chlorotettix emarginata*, n. sp.

Length, 6.25–6.5 mm. Vertex blunter than in *unicolor*; colour the same. Valve in male triangular and about the length of preceding segment. Plates about equalling pygofer, rounded at tips, but little wider towards the base, where each plate is suddenly depressed, giving the whole the appearance, as viewed from below, of being strongly constricted. Last ventral segment of female with lateral angles strongly produced backwards on either side of a broad, deep, rectangular emargination, the bottom of which is sinuate. Ovipositor equalling pygofer. Ocelli approximating eyes.

Described from two males and one female collected at Medellin, State of Vera Cruz, Mexico, by Rev. H. Th. Heyde. Resembles

*unicolor*, Fh. (=galbanata, Van D.), but is slightly larger and differs widely in the form of the genitalia, both male and female.

✓ *Chlorotettix breviceps*, n. sp.

Length, 6.25 mm. Vertex not longer at middle than at eyes. Ocelli black, scarcely further than their width from the eyes. Colour throughout pale brownish; two longitudinal whitish lines on scutel. Last ventral segment twice the length of preceding, hind margin very broadly, slightly notched. Ovipositor about equalling pygofer.

Described from two females in the Herbert H. Smith collection, taken at Chapada, Brazil, in May. Nearest *viridia*, but the vertex shorter, the ocelli smaller and further from the eyes, and the colour different. This insect has somewhat the aspect of an *Idiocerus*.

✓ *Chlorotettix minima*, n. sp.

Length, 5 mm. or slightly more or less. Ocelli large and very close to the eyes. Vertex distinctly, though but little, longer at middle than at eyes. Colour pale yellowish. Last ventral segment of female twice the length of preceding, lateral angles broadly rounded; medially with a deep narrow notch, extending more than half the length; the angles on either side of the summit of the notch projecting obliquely towards each other and sometimes nearly touching; in one specimen these projecting angles are nearly obsolete. Valve of male shorter than preceding segment and scarcely angled at middle. Plates rounded basally at sides, beyond middle becoming suddenly narrow and parallel-sided for rest of length.

Described from one male and several females in the Herbert H. Smith collection, taken at Chapada, Brazil, in April and May. The smallest species of the genus yet described. The form of the ventral notch varies, as it does in most species of the genus. In general form the species recalls *unicolor*, Fitch.

#### SOME NEW SPECIES OF COCCIDÆ.

BY J. D. TINSLEY, MESILLA PARK, N. MEX.

*Dactylopius Quaintancii*, n. sp.

Adult ♀. Length, 2 mm. Width, 1.5 mm. Shape, ellipsoidal, much flattened. Colour, dark grayish-brown, the body is so covered with white secretion that its true colour only shows on the ventral surface, the colour of the dorsum appearing quite white. The white secretion mealy, projecting slightly on the lateral margins, but not forming well-marked filaments; posteriorly it is produced into two very short, but well-defined, caudal filaments; on the dorsum it is slightly raised into a longitudinal ridge.

In addition to the mealy secretion, there is some fine, waxy, thread-like secretion as in *D. virgatus*, Ckll. They produce no well-defined ovisac, only a fluffy mass of secretion.

Boiled in caustic potash they become, at first, almost black, and on further boiling they become purplish. Legs and antennæ brownish, but very much lighter than the body.



FIG. 17.

Antennæ 7-jointed: 7 longest, slightly longer than  $2 + 3$  ( $90-100 \mu$ ); 2 and 3 next longest, usually subequal, about twice as long as broad; 1 and 6 next longest, often subequal, 1 sometimes the longer; 4 and 5 shortest and usually subequal. The antennæ are fairly stout, especially joints 1, 2 and 3; all joints are hairy, the hairs being long and slender. Antennal formula  $7(23)(16)(45)$ . (See Fig. 17.)

Legs.—Femur very stout, being only about twice as long as broad, with scattered, long, slender hairs; tibia stout, its width about half that of the femur, with a few long, slender hairs; tarsus stout, quite hairy, bearing a pair of long, slender digitules; claw stout, bearing a pair of knobbed digitules. Leg resembles that of a *Ripersia*. (See Fig. 18.) Male unknown.

Habitat.—Lake City, Florida, Feb. 9, 1898. On *Rhus copallina*, L.; collected by Mr. A. L. Quaintance.

Remarks.—The most prominent characteristics of this species are: Its small size, stoutness of legs and antennæ, and the comparatively great length of the terminal joint of the antenna.

*DACTYLOPIUS VIRGATUS*, Ckll.

Some time since I received from Mr. E. E. Green, of Ceylon, specimens of *Dactylopius ceriferus*, Newst., and, having at hand the type material of *virgatus*, I carefully compared them, both as to their external features and their antennæ and legs.

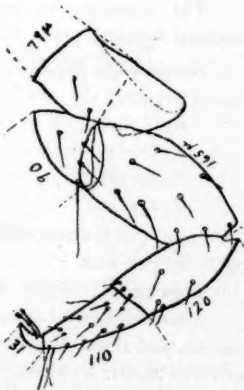


FIG. 18.

The specimens from either Jamaica or Ceylon differ as much in size and colour among themselves as they differ from those of the other locality.

The Jamaica specimens agree quite closely with Mr. Newstead's description, and *vice versa*.

To form an idea of the variability of this species one has only to note the fact that Mr. Cockerell distinguished four varieties in addition to the typical species growing on various plants in Jamaica.

The most prominent characters, which are constant, are, first, the elongated shape, tapering posteriorly, and second, the presence of the peculiar waxy filaments which are quite distinct from the ordinary white filamentous secretion of the genus.

The antennæ are quite variable, as may be seen from the following measurements of the type material from Jamaica: First joint, 45-60  $\mu$ ; second, 55-80  $\mu$ ; third, 85-95  $\mu$ ; fourth, 45-55  $\mu$ ; fifth, 50-65  $\mu$ ; sixth, 55-60  $\mu$ ; seventh, 53  $\mu$ ; eighth, 115-120  $\mu$ .

Measurements of the Ceylon material vary as follows: First joint, 59-65  $\mu$ ; second, 67-76  $\mu$ ; third, 90-104  $\mu$ ; fourth, 53-57  $\mu$ ; fifth, 53-65  $\mu$ ; sixth, 51-62  $\mu$ ; seventh, 56-62  $\mu$ ; eighth, 120-127  $\mu$ . I have also recently examined specimens from Mexico, and find them to fall between the Jamaica and Ceylon specimens in size. It will be noticed that the Ceylon specimens are longer than those from Jamaica.

The variations in relative length are well shown in the following antennal formulæ:

<i>Jamaica specimens.</i>	<i>Ceylon specimens.</i>	<i>Mexico specimens.</i>
(83)(24)(567)	382(4567)	832(45)(16)7
83267(45)	83216745	8324(16)57
83(26)(57)14	8321(67)54	
832(156)47	83245716	
832(4567)		

Joint 3 of the antenna is, however, always quite long, always appreciably longer than 2.

Legs agree perfectly with the published descriptions.

After this careful examination, I am convinced that these are all one species, and since Mr. Cockerell published his *virgatus*, about a year previous to Mr. Newstead's publication of *ceriferus*, *D. ceriferus*, Newst., will stand as a synonym for *D. virgatus*, Ckll.

The Mexican specimens were collected on coffee at Cuantla, Morelos,



Mexico, July, 1897, by Mr. A. Koebele, and sent to the New Mexico Expt. Station by Mr. L. O. Howard. This is the first time that *D. virgatus*, Ckll., has been found in Mexico.

*PHENACOCCLUS MINIMUS*, n. sp.—Adult ♀. Length about 1 mm. Shape, somewhat globular. Colour, reddish-pink.

Body nearly naked, and shining. No lateral filaments; a pair of short, stout, flattened, caudal filaments.

Antennæ (see Fig. 19) of 9 segments: segment 9 longest: segments 2 and 3 next longest, these may be subequal, or three may be the shorter; segment 1 next, and fairly stout; segment 6 about same length as 1, although it may be a little shorter; segment 7 next; segments 4, 5 and 8 subequal, and shortest.

Formula 9(23)167(458). Segments of antennæ with very long, fine hairs. While the fully-developed antennæ have 9 segments, and are well represented in the figure, yet a large proportion of the individuals examined have 7 and 8 segments. Those with 8 segments are due to the failure of segment 8 to divide. Those with 7 are due to lack of division in 3 and 8. The division in the 8th segment (terminal segment) is never so distinct as that between the other segments.

Legs.—Femur, length  $185\mu$ , width  $50\mu$ ; with some long, slender hairs. Tibia, length  $185\mu$ , width  $30\mu$ , with rather slender hairs. Tarsus, length  $85\mu$ , proximal end nearly as wide as tibia, tapering toward the distal end to join the slender claw; hairs similar to those on tibia; a pair of slender hair-like digitules, not knobbed. Claw, length  $25\mu$ , slender, with a small denticle on its inner face. A pair of slender, knobbed digitules longer than the claw.

Anal ring normal. Anal lobes well developed.

Ovisac.—Apparently without definite shape, just a fluffy mass of fairly coarse filaments, enclosing the pale yellow, almost white, eggs, and partially enclosing the female.

Male unknown.

Habitat.—On silver spruce, *Picea pungens*, Engelm. The specimens were near the end of the twig on one side, at the base of the needles, and had apparently caused the death of the needles.

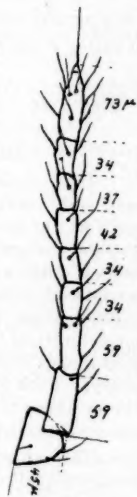


FIG. 19.

Collected by Prof. C. P. Gillette, at Fort Collins, Colo., May 20, 1898.

The minute size of this species easily distinguishes it from any species known at present. Unless considerable care is exercised only the 7- and 8-segmented antennæ will be found, and one would, from this, be inclined to call it a *Dactylopius*.

NOTE ON A CHALCIDID OF THE SUBFAM. ENCYRTINÆ, PARASITIC  
ON PHENACOCOCCUS MINIMUS.

BY T. D. A. COCKERELL, N. M. AGR. EXP. STA.

*Tetracnemus Westwoodi*, n. sp.—♂. Length  $1\frac{1}{5}$  mm.; dark brown; head and thorax minutely reticulated; ocelli large and prominent, lateral ocelli nearer to the eyes than to the middle ocellus; scutellum prominent; scapulæ triangular, produced to a point mesad, failing to meet by a short interval only; coxæ large and swollen, trochanters small, legs long, tarsi five-jointed. Antennæ 8-jointed, or 10 jointed if the two ring-joints are counted; first joint of flagellum subglobose, short; second about as long, but cylindrical; third about twice as long as second; fourth about one-third longer than third; fifth about as long as fourth; sixth (club) a little longer. First four joints of flagellum emitting long branches as in Westwood's figure of *T. diversicornis*. Club slender, considerably less swollen than in *diversicornis*. Wings strongly pubescent.

*Hab.*—Fort Collins, Colo.; parasitic in *Phenacoccus minimus*, Tinsley; collected by Prof. Gillette. Prof. Tinsley directed my attention to this interesting parasite, which he found when describing the *P. minimus*. The parasite is almost as large as the host, and always occurs singly. Prof. Tinsley observes that the head of the parasite is invariably turned to the tail of the *Phenacoccus*. The only specimens yet available for study are those mounted (after boiling) with the coccids, still enclosed in the skin of the host, though fully formed in every respect. It may be that specimens preserved in the usual way will show a somewhat different coloration, but the structural details will not be altered. The species is dedicated to the founder of the genus, who was the greatest of English entomologists. It differs in the scapulæ, the antennal club, and some other particulars, from *T. diversicornis*. The genus is new to America. (See L. O. Howard, Proc. U. S. Natl. Museum, XV., p. 362.)

Since the description of *Tetracnemus Westwoodi* was written, we have received many living specimens, of both sexes, from Prof. Gillette. The living insect is black, with a slight metallic tinge, the mesothorax a bluish-black, the scutellum purple-black, rather sharply contrasting. Antennæ of ♂ dark brown; of ♀, with scape and club, brown-black, the intermediate portion white. Legs yellowish-white, tarsi more or less infuscated, hind femora black.—T. D. A. C.

Mailed August 9th, 1898.

